

CLAIMS

1. A display subsystem for a portable handheld device comprising:
a main display screen configured for fixed mounting to a housing of a portable
handheld device;

5 an auxiliary display screen configured for movable mounting to the housing; and
a display screen drive mechanism including
a dual-screen video memory, and
an interface between said memory and said main screen and between said
memory and said auxiliary display screen,

10 said interface adapted to enable pixel data from a first segment of said video
memory to be presented on said main display screen and to enable pixel data from a
second segment of said video memory to be presented concurrently on said auxiliary
display screen.

15 2. The display subsystem of claim 1, wherein said interface selectively enables pixel
data from said second segment of said video memory to be presented on said auxiliary
display screen.

20 3. The display subsystem of claim 1, wherein said auxiliary display screen is
mounted to the housing for pivotal movement relative to said main display screen.

25 4. The display subsystem of claim 3, wherein said interface between said memory
and said auxiliary display screen includes a spirally or helically wound flexible ribbon
cable to physically enable the pixel data from the second segment of said video memory
to be presented on said auxiliary display screen.

30 5. The display subsystem of claim 1, wherein said auxiliary display screen is
mounted to the housing for sliding movement relative to said main display screen
between a first stowed position substantially within the housing and a second deployed
position substantially external thereto.

6. The display subsystem of claim 5, wherein said interface between said memory and said auxiliary display screen includes a flexible ribbon cable to physically enable the pixel data from the second segment of said video memory to be presented on said auxiliary display screen, the flexible ribbon cable disposed along a serpentine path within
5 the housing when said auxiliary display screen is in the first stowed position within the housing and the flexible ribbon cable disposed along a substantially linear path within the housing when said auxiliary display screen is in the second deployed position external to the housing.

10 7. The display subsystem of claim 1, wherein said dual-screen video memory is configured to store pixel data in said first and second segments thereof representing a substantially contiguous display to be presented on said main display and said auxiliary display.

15 8. The display subsystem of claim 1, which further comprises:
a user input mode control mechanism operable to control whether said first and second segments of said dual-screen video memory stores pixel data representing a substantially contiguous or substantially discontiguous display to be presented on said main display and said auxiliary display.

20 9. The display subsystem of claim 1, wherein said auxiliary display screen is movably but substantially inseparably mounted to the housing.

25 10. The display subsystem of claim 1, wherein said auxiliary display screen is intimately physically attached to the housing.

30 11. The display subsystem of claim 1, wherein said interface includes a high-speed video replay mechanism to couple at least one of said main display screen and said auxiliary display screen to a respective one of said first and second segments of said video memory.

12. The display subsystem of claim 1, wherein said interface includes a hardware rendering mechanism to couple at least one of said main display screen and said auxiliary display screen to a respective one of said first and second segments of said video memory.

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13. The display subsystem of claim 1, wherein said auxiliary display screen is a flat panel.

10 14. The display subsystem of claim 1, wherein said auxiliary display screen is mounted to the housing in a configuration such that an edge of the auxiliary screen is adjacent an edge of the main screen.

15. A portable handheld device comprising:

15 a housing configured as a part of a body of the handheld device;

15 a main display fixedly mounted within the body of the device;

20 an auxiliary display movably mounted to the body of the device, the auxiliary display manually selectively deployable for viewing;

20 a processor contained within the housing to manage a screen video memory;

25 a screen video memory contained within the housing, the memory operatively connected to said processor, the memory including a screen image video memory to store pixel data for said main display and a screen image video memory to store pixel data for said auxiliary display; and

25 a keyboard operatively connected to said processor, said keyboard mounted on an exterior face of the housing, the keyboard configured for key entry to effect pixel image displays on one or more of said main display and said auxiliary display.

30 16. The device of claim 15, wherein said auxiliary display is pivotably mounted on the housing.

30 17. The device of claim 15, wherein said auxiliary display is slidably mounted on the housing.

18. The device of claim 17, wherein said auxiliary display is slidable for stowage to an interior of the housing, and wherein said auxiliary display is slidable to deploy the same to an exterior of the housing for viewing.

5 19. The device of claim 15 which further comprises an interface between said memory and said main display and between said memory and said auxiliary display, wherein said interface between said memory and said auxiliary display includes a spirally or helically wound flexible ribbon cable to physically enable the pixel data from the screen image video memory to store pixel data for said auxiliary display to be
10 presented on said auxiliary display.

15 20. The display subsystem of claim 15, wherein said auxiliary display is mounted to the housing to slide relative to said main display between a first stowed position substantially within the body of the device and a second deployed position substantially external thereto.

20 21. The display subsystem of claim 15 which further comprises an interface between said memory and said main display and between said memory and said auxiliary display, wherein said interface between said memory and said auxiliary display includes a flexible ribbon cable to physically enable the pixel data from the screen image video memory to store pixel data for said auxiliary display to be presented on said auxiliary display, the flexible ribbon cable disposed through a substantially 180° turn within the body of the device when said auxiliary display is in a first stowed position within the body and the flexible ribbon cable disposed along a substantially linear path within the
25 body when said auxiliary display is in a second deployed position external to the housing.

30 22. The display subsystem of claim 15, wherein said dual-screen video memory stores pixel data in said first and second segments thereof to represent a substantially contiguous display to be presented on said main display and said auxiliary display.

23. The device of claim 15 which further comprises:

a high-speed video replay mechanism operatively coupled between at least one of said main display and said auxiliary display to a respective one of said screen image video memories.

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24. The device of claim 15 which further comprises:

a hardware rendering mechanism operatively coupled between at least one of said main display and said auxiliary display to a respective one of said screen image video memories.

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25. The device of claim 15, wherein said auxiliary display includes a flat panel.

26. The device of claim 15, wherein said auxiliary display is mounted to the housing in such a configuration that an edge of the auxiliary screen is adjacent an edge of the main screen.

27. A method of augmenting the effective capacity of a display subsystem integral with a portable handheld device having a display video memory and a main display, the method comprising:

20 augmenting the display video memory to provide an auxiliary display video memory;

providing an auxiliary display integrally connected with the device and operatively coupled with the auxiliary display video memory; and

25 providing the device with a dual-display video memory management mechanism to concurrently route pixel data from the main and auxiliary display video memories to the main and auxiliary displays.

28. The method of claim 27, wherein said providing of the auxiliary display is performed such that the auxiliary display is movably mounted to a body portion of the device.

29. The method of claim 28, wherein said providing of the auxiliary display is performed such that the auxiliary display is pivotably or slidably mounted to a body portion of the device adjacent an edge of the main display.

5 30. The method of claim 29 which further comprises:

providing a flexible cable extending between an outside edge of the main display and an inside edge of the auxiliary display to route pixel data therebetween.